6. *Cylindropuntia spinosior* (Engelm.) F.M.Knuth

In: Backeberg & Knuth *Kaktus-ABC*: 122 (1936).

Common names: cane cholla, spiny cholla (English).

Compact shrubs, tree-like, 0.4–2.0 m tall; branches whorled, segments 5–23 cm long, 1.3–3.5 cm in diameter, green to purplish; tubercles oval, usually 5–15 mm high, crowded; areoles often elliptical, wool yellow to tan, ageing darker; glochidia inconspicuous, 1–2 mm long, yellow to tan, ageing grey. Spines 4–24, on most areoles, interlacing, tan to pink to reddish brown; sheaths whitish, baggy. **Tepals** spathulate, rose, reddish purple, bronze purple, whitish, yellow or salmon-coloured. **Fruit** broadly cylindrical, 2–5 × 1.7–3 cm, fleshy, rarely proliferating, strongly tuberculate, with 28–50 or more areoles, tubercles longer in distal portion, yellow to almost orange when ripe, sometimes tinged with purple. **Distribution**: SA. (Fig. 135)

References: Hunt *et al*. (2006).

Cylindropuntia spinosior (Fig. 136, 137, 138) is very similar to *Cylindropuntia imbricata*, and differences are discussed under that species. Though its description is very similar to that of non-crested forms of *Cylindropuntia fulgida* var. *mamillata*, the latter is readily distinguished by its easily detached terminal segments, recurved tepals and proliferous fruit chains.

It occurs in dry grassland and desert in a range (Pinkava, 2003a; Hunt, 2006) between and overlapping those of *C. fulgida* to the west (Sonoran Desert), and *C. imbricata* to the east (Chihuahuan Desert), from Arizona and New Mexico (USA) to Sonora and Chihuahua (Mexico). Hybrids are formed in the overlapping areas, particularly with *C. imbricata* (Pinkava, 2003a).

Cylindropuntia spinosior is sometimes cultivated in South Africa, and has now been found to be naturalised near Hopetown and Pofadder (Northern Cape Province) and east of Beaufort West (Western Cape Province). Even though this species is not a declared weed in South Africa, it requires monitoring.

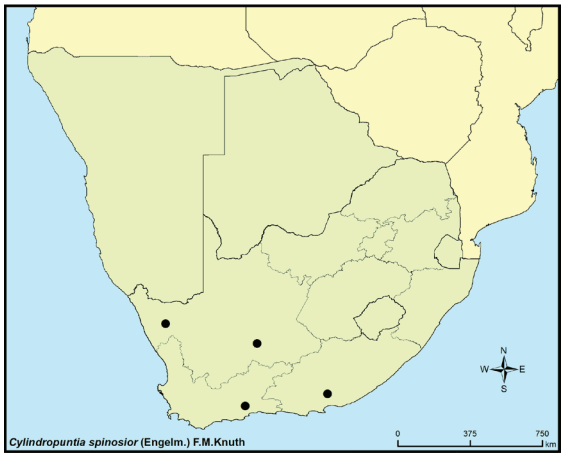

Fig. 135. Distribution map of *Cylindropuntia spinosior* (Engelm.) F.M.Knuth

Fig. 136. *Cylindropuntia spinosior* (Engelm.) F.M.Knuth.
(Picture by Helmuth G. Zimmermann)

Fig. 137. Flower of *Cylindropuntia spinosior* (Engelm.) F.M.Knuth.
(Picture by Helmuth G. Zimmermann)

Fig. 138. Fruit of *Cylindropuntia spinosior* (Engelm.) F.M.Knuth.
(Picture by Helmuth G. Zimmermann)

Echinopsis Zucc.

Shrubby, columnar; branches erect, ascending, sometimes toppling over, simple, distinctly ribbed, very spiny; ribs numerous. **Flowers** subapical, elongate-funnelform, nocturnal or diurnal, large; pericarpel and hypanthium with relatively narrow, often numerous scales; pericarpel areoles more or less densely hairy. **Stamens** numerous. **Fruit** globose, fleshy. **Seed** broadly ovoid to orbicular, 1.2–1.6 × 0.8–1.4 mm, black-brown, matt, relief flat to low-domed.

Reference: Hunt *et al*. (2006).

A large genus endemic to South America, but with uncertain and fluctuating limits involving over 500 species names. The number of accepted species has been reduced from Anderson's (2001) count of 128 to 77 (Hunt, 2006). This figure, despite a broader generic concept than earlier, is the result of combining taxa, reducing species to subspecies, or of rejecting names of irreconcilable application.

In South Africa, the genus is easily recognised by the clumps of densely reddish- to golden, spiny, simple, columnar stems usually more than 8 cm in diameter.

Echinopsis schickendantzii F.A.C.Weber

In: *Dictionnaire d'Horticulture* 473 (1896).

=*Trichocereus schaferi* Britton and Rose

Common names: columnar torch cactus, torch cactus (English); orrelkaktus (Afrikaans).

Multistemmed shrubs 1–1.7(–2.5) m tall; stems green, columnar, (6–)8–10(–13) cm in diameter, branching from base or below ground (rarely above ground); ribs 10–15, c. 1.3 cm high, margins relatively straight or evenly spiral; areoles c. 1–1.5 (–2.5) cm apart, with curly yellow wool. Spines straight, yellow or reddish yellow when young, ageing brown or whitish; central spine single, 1.1–2(–2.7) cm long, peripheral spines 8–10, (4–)6–10 mm long, thin, sharp. **Flowers** from Nov. to Mar., showy, 18–20 cm long, mouth up to c. 15 cm in diameter; tepals white; pericarpel and hypanthium covered with long, dark hairs; pericarpel areoles densely hirsute in upper half. **Fruit** spherical, c. 5 cm long, green, remaining clothed with long, dark hairs of pericarpel and conspicuous, persistent hypanthium, dehiscent along one side; pulp white. **Seed** small, dull black-brown (virtually black), more or less warty, mostly sterile. **Distribution**: B, N, SA. (Fig. 139)

References: Anderson (2001), Henderson (2001), as *Echinopsis spachiana* (Lem.) Friedrich & G.D.Rowley (sp. insufficiently known).

This species can be distinguished from other naturalised, densely spiny, columnar cacti in South Africa by the wide stems with subapical flowers, and long, blackish hairs obscuring the pericarpel (Fig. 140). This plant was previously known in southern Africa by the name *Echinopsis spachiana*, which appeared to have been distinguished from *E. schickendantzii* only by the height of the stem (Fig. 141),

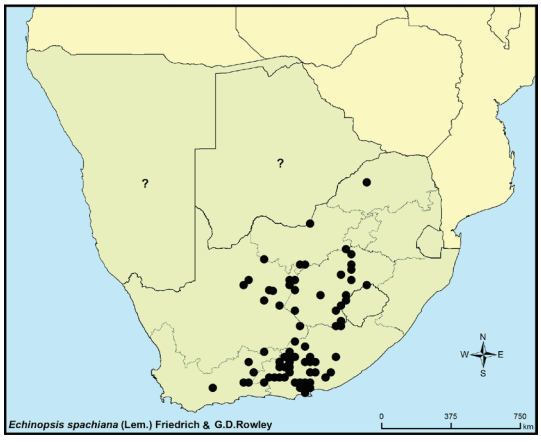

Fig. 139. Distribution map of *Echinopsis schickendantzii* F.A.C.Weber.

a character that is already variable in the species. It differs from the Bolivian *E. volliana* (Backeb.) Friedrich & G.D.Rowley in its longer flowers (12–15 cm in *E. volliana*).

Echinopsis schickendantzii is from Argentina (Hunt, 2006). The plant known as *E. spachiana* was said to have originated in western Argentina (Anderson, 2001) but Hunt *et al*. (2006) regard it as of 'uncertain' origin. Hunt *et al*. (2006) listed the name *E. spachiana* under the heading 'Names whose original application is indeterminate or debatable'. They regarded it as untypifiable, as no type material had been preserved, and treated it as a name 'best abandoned'. The type locality was simply given as 'Mexico', which is either a mistake or based on a cultivated plant.

Echinopsis schickendantzii is grown for ornamental purposes and as a hedge plant (Henderson, 2001) and the impressive mass display of its large white flowers (Fig. 142), all opening at the same time, makes it a very attractive and popular garden ornamental. Hunt (1989, 2006) points out the suitability of *Echinopsis schickendantzii*, *E. spachiana* and *E. volliana* for use as grafting stocks.

In South Africa it is a potential habitat transformer and a declared weed that is often encountered in dry savanna and karoo (Henderson, 2001, 2007). This species has been increasing in abundance over the last decade or two (Henderson, 2010). The white fruit pulp (Fig. 143) is eagerly consumed by birds, resulting in seedlings establishing under any suitable perch and even on roofs. Its spread could take on similar proportions to those of *Opuntia ficus-indica* in the early twentieth century, unless urgent action is taken to control its spread (Henderson, 2010).

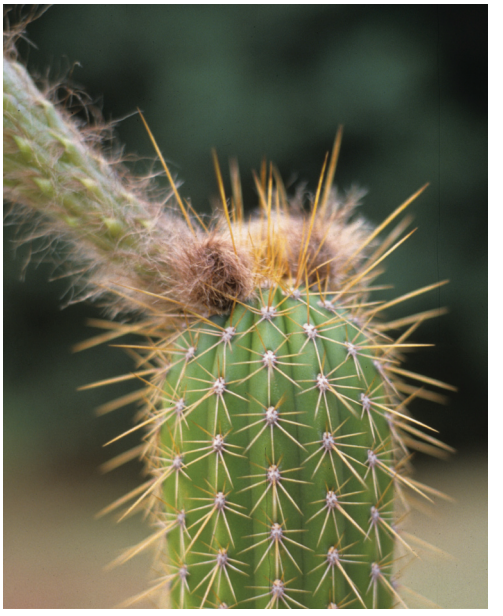

Fig. 140. The pericarpels of *Echinopsis schickendantzii* F.A.C.Weber are obscured by blackish hairs. (Picture by Gideon F. Smith)

Fig. 141. *Echinopsis schickendantzii* F.A.C.Weber. (Picture by Neil R. Crouch)

Fig. 142. Flowers of *Echinopsis schickendantzii* F.A.C.Weber. (Picture by Neil R. Crouch)

Fig. 143. Fruit of *Echinopsis schickendantzii* F.A.C.Weber. (Picture by Lesley Henderson)

Harrisia Britton

Mostly shrubs, sometimes scandent or tree-like, up to 7 m tall; branches usually slender, ribbed, not segmented, not rooting aerially; ribs 3–5(–12). **Flowers** nocturnal, funnelform, 12–22 cm long; hypanthium elongate; perianth 8–17 cm broad, white; pericarpel areoles with hair-spines or merely felted**. Fruit** fleshy, areolate and scaly and/or spiny, yellow or orange and not splitting (subg. *Harrisia*), or red and usually splitting (subg. *Eriocereus*). **Seed** broadly ovoid, 1.5–4.0 × 1.2–1.8 mm, black-brown, semi-matt, periphery crested with larger cells, relief low-domed; hilum-micropylar region of medium size, basal, deeply impressed, forming a chamber.

References: Obermeyer (1976), Parfitt (2003), Hunt *et al*. (2006).

A member of the tribe Trichocereeae, *Harrisia* has a disjunct natural occurence in tropical America, with one or two species in subgenus *Harrisia* from Florida and across the Caribbean islands, and six or seven species in subgenus *Eriocereus* from South America in Brazil, Paraguay, Bolivia and Argentina (Anderson, 2001; Hunt, 2006).

The two species in South Africa are both in subgenus *Eriocereus*, and have long, flexible, narrow branches with areoles relatively far apart. The areoles lack glochidia. Pericarpel and hypanthium scales are numerous and relatively dense to overlapping, with hairy to villous axils.

Key to the two species of *Harrisia* naturalised in southern Africa:

1. Central spine 2.5–3 cm long; peripheral spines 1–2 cm long. Flowers 5–10 cm wide; pericarpel and hypanthium scales c. 2 cm long. Fruit up to 7 cm in diameter, with conspicuous scales with axillary villous hairs . . . . . **1. *Harrisia balansae***

1'. Central spine 2–3 (–4) cm long; peripheral spines 1–3 mm long. Flowers 15–17 cm wide; pericarpel and hypanthium scales 2–3 mm long. Fruit c. 3 cm in diameter, scales not conspicuous . . . . . **2. *Harrisia martinii***

1. *Harrisia balansae* (K.Schum.) N.P.Taylor & Zappi

In: *Cactaceae Consensus Initiatives* 3: 7 (1997).

Clambering shrub, 1–4 m, but reputedly up to 25 m tall; trunk up to 8 cm in diameter; branches segmented, obtusely 3–4(–5)-angled, 3–4(–5) cm in diameter. Spines c. 6, 1 stouter and longer (2.5–3 cm long) than the rest (1–2 cm long). **Flowers** large, 15–20 × 5–10 cm; pericarpel and hypanthium scales c. 2 cm long, without spines, numerous and relatively dense to overlapping on the hypanthium, with hairy to villous axils; flowering areole nearly naked. **Fruit** 4–7 cm in diameter, strongly tuberculate, each tubercle topped by a persistent scale, axils villous-hairy**. Seed** large (c. 2.5 mm long), rugose, black-brown (virtually black). **Distribution**: SA. (Fig. 144)

Reference: Kiesling (1996).

This account follows Hunt *et al*. (2006), who rejected the name *Harrisia bonplandii,* (Pfeiff.) Britton & Rose, considering it a source of confusion as it could not be satisfactorily typified, despite a thorough analysis by Leuenberger (2001).

This plant has previously been misidentified as *Acanthocereus tetragonus* (L.) Hummelinck of the tribe *Pachycereeae*, which has smaller hypanthium scales that are set further apart (fewer), the axils of which are felted and sometimes spiny, though not hairy. It also has branches sharply 3–5(–7)-winged or -angled, pericarpel scale axils that are usually spiny, and a stout, rigid, markedly flared hypanthium.

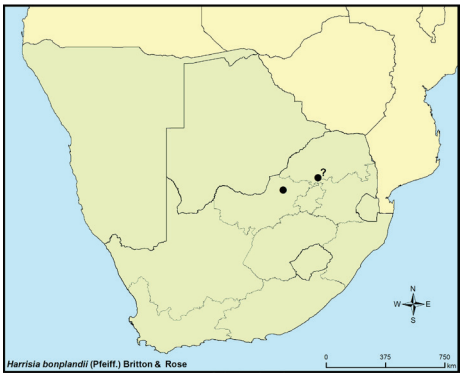

Fig. 144. Distribution map of *Harrisia balansae* (K.Schum.) N.P.Taylor & Zappi.

In contrast, *Harrisia balansae* has a relatively slender hypanthium, with numerous scales (relatively dense) the axils of which are villous-hairy and without spines (Fig. 145). Its branches rarely have as many as 5 obtuse ribs or angles (Fig. 146), and its pericarpel scale axils are also villous-hairy, without spines.

It can further be confused with *Hylocereus triangularis* (L.) Britton & Rose, with spines only up to 7 mm long borne on crenations, and it bears a superficial resemblace to *H. undatus*, which has branches with much thinner, acute, horn-rimmed wings that are broadly crenate between areoles.

Harrisia balansae is native to Bolivia and Paraguay and adjoining parts of Brazil (Mato Grosso do Sul) and Argentina (Gran Chaco) (Anderson, 2001). In South Africa it has been recorded in two localities: one in North-West Province near Groot Marico (Fig. 147), and a doubtful record of a few plants near Rust de Winter, Limpopo Province. This is an emerging invader and could be subject to a rapid eradication response programme in view of its potential risk and limited distribution.

Harrisia balansae is susceptible to infection by the mealybug *Hypogeococcus pungens* (Fig. 148). However, further observations are needed to verify if additional control measures are required, since infested plants produce fruits that are eagerly consumed by frugivorous birds. The seeds of infested plants are therefore still dispersed.

Fig. 145. Fruit of *Harrisia balansae* (K.Schum.) N.P.Taylor & Zappi. (Picture by Helmuth G. Zimmermann)

Fig. 146. Branches of *Harrisia balansae* (K.Schum.) N.P.Taylor & Zappi are rarely up to 5-ribbed. (Picture by Helmuth G. Zimmermann)

Fig. 147. *Harrisia balansae* (K.Schum.) N.P.Taylor & Zappi in Groot Marico.
(Picture by Helmuth G. Zimmermann)

Fig. 148. *Harrisia balansae* (K.Schum.) N.P.Taylor & Zappi damaged by mealy bug infection.
(Picture by Helmuth G. Zimmermann)

2. *Harrisia martinii* (Labour.) Britton

In: *Addisonia* 2: 55, pl. 68 (1917).

=*Eriocereus martinii* (Labour.) Riccob.

Common names: harrisia cactus, Martin's harrisia, moon cactus (in Australia) (English); toukaktus (Afrikaans).

Sprawling or clambering shrub, capable of resprouting from an underground rootstock, c. 0.8(–2) m tall; stems much-branched, often arching; branches dark green, (1.5–)2–2.5(–4) cm in diameter, not rooting aerially; ribs 4–5, low, lending the stems an appearance of plaited rope; areoles seated on broad tubercle, 1.5–2.5(–3.5) cm apart. Central spine 1(–2), 2–3(–4) cm long; peripheral spines 1–3 (–7), up to 3 mm long. **Flowers** nocturnal, from Nov. to Mar., 15–22 × 15–17 cm; scales broadly triangular-subulate, 2–3 mm long; pericarpel areoles felted and more or less hairy; outer tepals narrow, greenish white; inner tepals white or pale pink. **Fruit** from Dec. to May, globose, c. 3 cm in diameter, tuberculate and very shortly spiny, red, splitting down one side; pulp white. **Seed** black-brown (virtually black). **Distribution**: N, SA. (Fig. 149)

References: Obermeyer (1976), Zimmerman (1983), Telford (1984), Kiesling (1996), Henderson (2001), Hunt *et al*. (2006).

Harrisia martinii (Fig. 150, 151) originates from the Gran Chaco region of Paraguay and Argentina (Anderson, 2001; Hunt, 2006), probably in seasonally arid savanna habitats similar to the invaded habitats in South Africa. In Argentina it occurs in Chaco, Corrientes, Entre Ríos, Formosa and Santa Fé provinces (Kiesling, 1996; Hunt, 2006).

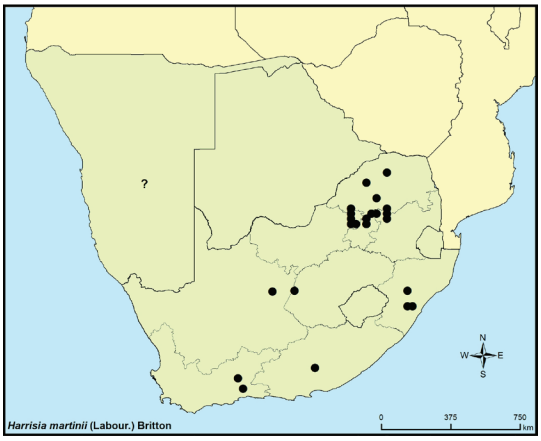

Fig. 149. Distribution map of *Harrisia martinii* (Labour.) Britton.

Fig. 150. Flower of *Harrisia martinii* (Labour.) Britton. (Picture by Pieter J.D. Winter)

Fig. 151. Fruit of *Harrisia martinii* (Labour.) Britton. (Picture by Pieter J.D. Winter)

The harrisia cactus was a serious invader in Australia (Fig. 152) and parts of South Africa (KwaZulu-Natal, Limpopo, Northern Cape and North-West Province) (SAPIA data). It is sporadically naturalised across the savanna biome of South Africa (Henderson, 2001, 2007) and is a declared weed (Henderson, 2001) (category 1), due to the transformation of woodland. Chemical control is difficult because of the underground tubers which are hard to reach. South Africa profited from a successful biological control programme in Australia in the late seventies. The two natural enemies, originally from Argentina, were eventually also introduced to South Africa where they also provide good control. They are the mealybug, *Hypogeococcus pungens*, released in 1983, and the long-horn stemborer, *Alcidion cereicola*, released in 1990 (Klein, 1999).

Fig. 152. *Harrisia martinii* (Labour.) Britton was an invader in Australia.
(Picture by Stefan Neser)

Hylocereus (A.Berger) Britton & Rose

Climbers or scramblers, often epiphytic or epilithic (lithophytic); often much more than 5 m high**;** branches usually 3-winged or angled, segmented, green or glaucous, the margins often horny, producing aerial roots**.** Spines short or rarely absent. **Flowers** usually very large, funnelform, nocturnal, white or rarely red; pericarpel and hypanthium stout; scales typically broad, triangular, sometimes small or rudimentary; pericarpel areoles naked or spiny. **Stamens** numerous in a continuous series. **Style** thick; stigma lobes sometimes bifid. **Fruit** large, globose, ovoid or oblong, fleshy, with broad scales. **Seed** ovoid or broadly ovoid, c. 2.5 × 1.5–2 mm, black-brown, smooth; hilum-micropylar region of medium size, oblique, superficial; mucilage sheath present, covering entire seed.

References: Parfitt (2003), Taylor & Zappi (2004), Hunt *et al*. (2006), N.P. Taylor, (*pers. comm*.).

As currently circumscribed, *Hylocereus* comprises 14 species from tropical America, only one of which has become naturalised in southern Africa. They climb or scramble high into trees or over lower vegetation, aided by climbing aerial roots that often form dense mats around a supporting tree trunk. The branch segment wings are acute and usually spineless or with short spines less than 7 mm long, whereas branch segments of *Harrisia* are obtuse or rounded in transverse section and have spines more than 1 cm long. The nocturnal flowers are amongst the largest in the family (N.P. Taylor, *pers. comm*.).

Hylocereus undatus (Haw.) Britton & Rose

In: Britton, *Flora of Bermuda*: 256 (1918).

Common names: belle of the night, conderella plant, dragon fruit, night blooming cereus, red pitahaya, strawberry pear (English).

Climber 4–10 m high (sometimes epiphytic or epilithic): branches usually segmented, 3-ribbed, 4–7.5 cm in diameter, producing aerial roots; ribs compressed, thin, acute, margin crenate; areoles in the notches between teeth, usually 4–5 cm apart. Central spine absent or present, conical, 3–6 mm long, grey-brown; peripheral spines 0–2, 2–4 mm long. **Flowers** 25–30 × 15–25 cm; scales broad, imbricate; outer tepals lorate to linear, reflexed, bases greenish or yellowish, apices acuminate, red; inner tepals spathulate, up to 14 cm long, apices acute, fimbriate, white. **Stamens** of mature flower roughly parallel to perianth. **Style** cream; stigma lobes c. 24. **Fruit** globose-oblong, 10–15 × 10–12 cm, red; fruit scales long-pointed, up to 2.5 cm long, fleshy; pulp white. **Seed** black-brown (virtually black), shiny. **Distribution**: SA. (Fig. 153)

References: Anderson (2001), Parfitt (2003), Taylor & Zappi (2004), Hunt *et al*. (2006).

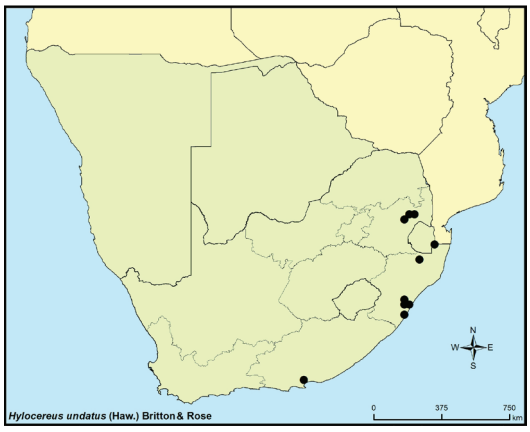

Fig. 153. Distribution map of *Hylocereus undatus* (Haw.) Britton & Rose.

This species may be confused with *Harrisia balansae*, which also has 3-ribbed branches. *H. balansae* differs in its lower, rounded ribs. *Hylocereus triangularis* differs by its angles not horn-rimmed, and the areoles borne on the crenations rather than in the sinuses between crenations. Its flowers are shorter (14–25 cm long), and the fruit is also smaller (7–10 × 3–5 cm) (Hunt, 2006).

Hylocereus undatus is probably native in tropical America, perhaps Mexico and Central America (Taylor & Zappi, 2004). Originally introduced to South Africa as an ornamental because of its spectacular, large, white, nocturnal flowers (Fig. 154), *Hylocereus* undatus and related species are becoming important commercial fruit plants in many countries, particularly in the tropics. The fruit is known as dragon fruit (a name also applied to fruit of *Hylocereus triangularis* (L.) Britton & Rose as produced in SE Asia — N.P. Taylor, *pers. comm*.) and is very attractive, with its red colour, large size and white pulp (Fig. 155). Dragon fruit (Fig. 156) is now becoming available in fresh produce markets in South Africa.

Hylocereus undatus is recorded as invasive in mesic, low-lying areas of KwaZulu-Natal (Fig. 157), Mpumalanga (Fig. 158) and Eastern Cape. Elsewhere individual plants persist where planted, but do not seem to reproduce. Infestations are still small and localised, originating mainly from homestead gardens from where they have escaped. The plant spreads by cuttings or vegetative parts that root to form new plants and with the aid of birds that spread the seeds. Control is not difficult. It is currently not a declared invader in South Africa, but should be proposed to be listed as a category 2 invader under NEMBA and CARA, as it has valuable commercial potential (L. Henderson, *pers. comm*.).

Fig. 154. Flower of *Hylocereus undatus* (Haw.) Britton & Rose.
(Picture by Geoff R. Nichols)

Fig. 155. Fruit of *Hylocereus undatus* (Haw.) Britton & Rose. (Picture by Geoff R. Nichols)

Fig. 156. Fruit of *Hylocereus undatus* (Haw.) Britton & Rose (dragon fruit) is commercially traded. (Picture by Helmuth G. Zimmermann)

Fig. 157. *Hylocereus undatus* (Haw.) Britton & Rose is invasive in KwaZulu-Natal. (Picture by Geoff R. Nichols)

Fig. 158. *Hylocereus undatus* (Haw.) Britton & Rose is invasive in Mpumalanga. (Picture by Lesley Henderson)

Myrtillocactus Console

Arborescent or shrubby; branches numerous, stout, ascending, few-ribbed, spiny. **Flowers** diurnal, up to 9 at each areole, small; scales small; hypanthium very short; perianth rotate; pericarpel areoles slightly woolly. **Stamens** relatively few. **Fruit** globose, small, fleshy, purple. **Seeds** broadly ovoid, 1.6 × 1.3 mm, black-brown, dull, relief low-domed; hilum-micropylar region of large size, basal, impressed.

References: Anderson (2001), Hunt *et al*. (2006).

This small genus is endemic to Guatemala and Mexico. It comprises four species that appear to be quite closely related (Hunt, 2006). It is unusual in its small flowers with few tepals that are borne in fascicles. The branches bear a slight resemblance to those of naturalised *Cereus* species, as well as to *Euphorbia ingens* E.Mey. ex Boiss., but the ribs are fewer, not as prominent, and wider at the base, and the spines are generally shorter and stouter.

Myrtillocactus geometrizans (Pfeiff.) Console

In: *Bollettino delle Reale Orto Botanico di Palermo* 1: 10 (1897).

Common names: bilberry cactus, whortleberry cactus (English); rosyntjiekaktus (Afrikaans).

Shrub or tree up to 4–5 m; trunk short; branches numerous, upcurving, 6–10 cm in diameter, blue-green; ribs 5–6, smooth, low, rounded; areoles 5–30 mm apart. Central spine 1, 1–7 cm long, dagger-like and sometimes 6 mm broad at the base, almost black; radial spines 5–9, 2–10 mm long, red-brown to blackish at first, fading to grey. **Flowers** c. 2 × 2.5–3.5 cm, creamy or greenish white. **Fruit** globose, spineless, 1–2 cm in diameter, dark red or purple, very tasty. **Distribution**: N, SA. (Fig. 159)

References: Anderson (2001), Hunt *et al*. (2006).

This species occurs in Guatemala and throughout the central and northern central parts of Mexico (Anderson, 2001; Hunt, 2006). In South Africa it has been recorded near Groot Marico (North-West Province) (Fig. 160) and in the Addo Elephant National Park (Eastern Cape Province).

Fig. 159. Distribution map of *Myrtillocactus geometrizans* (Pfeiff.) Console.

Fig. 160. *Myrtillocactus geometrizans* (Pfeiff.) Console. (Picture by Helmuth G. Zimmermann)

The botanical and English vernacular names allude to the resemblance of fruit (Fig. 161) to that of true myrtle, *Myrtus communis* L. (Anderson, 2001), or of billberry or whortleberry, *Vaccinium myrtillus* L. The fruit is widely eaten in Mexico, both fresh and dried like raisins, and is known as 'garambullo' (Anderson, 2001). The Afrikaans common name indeed translates as 'raisin cactus'.

Originally introduced as an ornamental, it is very easily confused with small *Euphorbia ingens* plants, also sharing the same habitat with this species. It can be distinguished from *E. ingens* by the absence of milky latex and cyathia (flower shown in Fig. 162), and the presence of an areole with a stout central spine and some radial spines as opposed to a spine shield with or without a pair of spines. Although its fruit is delicious, it is not widely consumed by humans in South Africa.